

## CLAIMS

*What Is Claimed Is:*

1. An automatic teller machine (ATM) electronically  
connected to one or more devices, the one or more devices  
5 comprising:

a deposit device configured to receive an initial bank  
note;

an image extraction device configured to extract one or  
more initial images from the initial bank note;

- 10 a transaction log device configured to attach a  
transaction log to the one or more initial images,  
wherein the deposit device is further configured to  
receive a subsequent bank note, wherein the image  
extraction device is further configured to extract  
15 one or more subsequent images from the subsequent  
bank note; and

a comparison device configured to compare the one or  
initial images to the one or more subsequent images  
in order to obtain a comparison result.

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2. The automatic teller machine of Claim 1, the one or more  
devices further comprising at least one of:

a storage device configured to store the one or more  
initial images and the transaction log; and

- 25 a network link to an external storage device configured  
to store the one or more initial images and the  
transaction log.

3. The automatic teller machine of Claim 1, wherein the comparison device is further configured to determine if the one or more initial images are within a range of similarity to the one or more subsequent images.

4. The automatic teller machine of Claim 1, wherein the image extraction device is further configured to:  
extract a front side initial image in a first initial position;  
extract a front side initial image in a second initial position;  
extract a back side initial image in a first initial position; and  
extract a back side initial image in a second initial position.

5. The automatic teller machine of Claim 4, wherein the image extraction device is further configured to:  
extract a front side subsequent image in a first subsequent position;  
extract a front side subsequent image in a second subsequent position;  
extract a back side subsequent image in a first subsequent position; and  
extract a back side subsequent image in a second subsequent position.

6. The automatic teller machine of Claim 5, wherein the comparison device is further configured to compare each subsequent image in each subsequent position a plurality  
5 of times to a corresponding initial image.

7. The automatic teller machine of Claim 3, the one or more devices further comprising a retrieval device configured to retrieve the transaction log if the comparison device  
10 determines that the one or more initial images are within the range of similarity.

8. The automatic teller machine of Claim 3, wherein the comparison device is further configured to analyze image  
15 characteristics using a Euclid distance formula, and further configured to determine whether the one or more initial images and the one or more subsequent images have a Euclid distance near zero, wherein the range of similarity includes having a Euclid distance near zero.

20 9. An interface to an automatic teller machine (ATM) of a bank, the interface having one or more screens configured to be displayed on a display of the automatic teller machine, the one or more screens comprising:  
25 a tracing mode, wherein use of the tracing mode requires special authorization by the bank;

- a kind option of the tracing mode, wherein the kind option is configured to be selected and to initiate instructions to display a request to input a subsequent bank note of a particular kind;
- 5 a start search option of the tracing mode, wherein the start search option is configured to be selected and to initiate instructions to begin a comparison between subsequent images of the subsequent bank note and initial images of an initial bank note; and
- 10 a comparison results screen of the tracing mode, wherein the comparison results screen is configured to display comparison results upon completion of the comparison.
- 15 10. The interface of Claim 9, wherein the kind option is further configured to display a request to input the subsequent bank note in a particular direction a plurality of different times.
- 20 11. The interface of Claim 9, wherein the tracing mode option, the kind option, and the start search option are each electronically connected to at least one of:  
a touch-sensitive portion of the one or more screens; and  
a mechanical button of the automatic teller machine.
- 25 12. A method of tracing bank notes, the method comprising:  
receiving a deposit of an initial bank note;

extracting one or more initial images from the initial  
bank note;  
attaching an initial transaction log to the one or more  
initial images;  
5 receiving one or more subsequent images of a subsequent  
bank note; and  
comparing the one or more initial images to the one or  
more subsequent images in order to obtain a  
comparison result.

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13. The method of Claim 12, wherein the comparison result  
indicates that the one or more initial images are within  
a range of similarity to the one or more subsequent  
images, the method further comprising retrieving the  
15 initial transaction log based on the comparison result.

14. The method of Claim 12, wherein the step of extracting  
one or more initial images comprises:

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extracting a front side initial image in a first initial  
position;  
extracting a front side initial image in a second initial  
position;  
extracting a back side initial image in a first initial  
position; and

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extracting a back side initial image in a second initial  
position.

15. The method of Claim 12, wherein the step of receiving one or more subsequent images comprises:

receiving a deposit of a subsequent bank note; and

extracting one or more subsequent images from the

5 subsequent bank note.

16. The method of Claim 15, wherein the step of extracting one or more subsequent images comprises:

extracting a front side subsequent image in a first

10 subsequent position;

extracting a front side subsequent image in a second

subsequent position;

extracting a back side subsequent image in a first

subsequent position; and

15 extracting a back side subsequent image in a second

subsequent position.

17. The method of Claim 16, wherein the step of comparing comprises comparing each subsequent image in each

20 subsequent position a plurality of times to a

corresponding initial image.

18. The method of Claim 12, wherein the one or more initial images include a unique characteristic that is specific

25 to only one bank note, wherein the initial bank note is

the only one bank note with the unique characteristic,

wherein the unique characteristic includes other

information besides a serial number of the initial bank note.

19. The method of Claim 13, wherein the step of comparing

5 comprises:

analyzing image characteristics using a Euclid distance formula; and

determining that the one or more initial images and the

one or more subsequent images have a Euclid distance

10 near zero, wherein the range of similarity includes

having a Euclid distance near zero.

20. The method of Claim 12, wherein the steps of the method

are stored on a computer-readable medium as one or more

15 instructions for tracing bank notes, wherein the one or

more instructions, when executed by one or more

processors, cause the one or more processors to perform

the steps of the method.

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